spect to the potential for contamination, and (3) present and anticipated land and surface water uses that can affect ground water. Information on water resource conditions and new ground water research must be easily available to decision makers. Table 4.1 summarizes the components of such an information base. Some of the needed data base components are available for most states, perhaps obtained as part of a ground water management program, but more often the data have been gathered for other purposes. Some states have a good understanding of the hydrogeology of their ground water basins, but for others such information is fragmentary. Some ground water systems are much more complex than others. The degree to which a sound management program can be structured will rely on the depth and breadth of the information base available. In this chapter, examples are given of the development and use of information bases to formulate ground water quality management policies and control strategies.

While all the information components listed in Table 4.1 are useful in an overall ground water quality management program, each aspect of a program may draw more heavily on one or only a few of the components. In this section, each of the four main components in Table 4.1 is described briefly to serve as examples of how they play a significant role in the development of an overall ground water management program. Each of these properties is complex and difficult to quantify.

Hydrogeology

One of the most basic needs of a ground water quality management program is an understanding of the system's hydrogeology. This will help determine the water yield characteristics of the aquifer; the suitability of the water, in terms of quality, for different beneficial uses; the degree of vulnerability of the aquifer to contamination at different locations; and the necessity for a stringent program of contamination control.

The characteristics of soils overlying an aquifer play a significant role in the potential for aquifer contamination. Aquifers overlain by permeable sands or gravels are highly vulnerable to surface contamination since contaminants can move rapidly through such materials. Clay, on the other hand, is rather impermeable and can retard contaminant movement, providing more time for corrective action on chemical spills. Knowledge of the boundaries of ground water basins and the characteristics of the aquifers themselves provides important information on the limits to which a contaminant may spread and the particular areas that are vulnerable to contamination from-individual sources.

With respect to aquifer characteristics, shallow unconfined aquifers are highly vulnerable to contamination compared with deep aquifers that are